

Section 6 — Neutron Mathematics

In the FUNt framework, the neutron is the state-selector of the nucleon system. Its behavior arises from φ - ψ lattice interactions, binding-energy gradients, and its unique role as a 'neutral torsional buffer' between proton shells. This section consolidates the neutron mathematics from the Neutron Force whitepaper and nucleon structure papers.

6.1 Neutron as Neutral Torsional Buffer

- Neutron contains torsional structure similar to the proton, but without net charge.
- Acts as the lattice-pressure equalizer inside nuclei.
- Stabilizes proton clusters by providing neutral φ -level spacing.
- [Insert visual diagram here]

6.2 Neutron Binding Energy (NF) Definition

- $NF = \Delta B / \Delta t$, where B is nuclear binding energy.
- NF measures the rate of binding configuration change.
- Determines which isotopes are stable vs unstable.
- [Insert visual diagram here]

6.3 Mass Defect and Nuclear Stability

- Binding energy from mass defect: $E_b = \Delta m c^2$.
- Neutrons produce greater coherence gain in mid-range nuclei.
- Stability peaks correspond to φ -shell configurations.
- [Insert visual diagram here]

6.4 Magic Numbers and ϕ -Shell Geometry

- Magic numbers (2, 8, 20, 28, 50, 82, 126) align with φ -tier spacings.
- Neutron configuration determines nuclear shell closures.
- Neutrons enforce φ -based shell completion.
- [Insert visual diagram here]

6.5 Dual-Decad Neutron Behavior

- Neutron modes follow the same φ^n ladder as protons/electrons.
- Neutron φ^5 - φ^6 modes determine binding energy thresholds.

- Neutron φ^7 mode matches decay-coupler resonance.

- [Insert visual diagram here]

6.6 Beta Decay and ϕ -Resonant State Change

- β -decay: $n \rightarrow p + e^- + \bar{\nu}_e$.

- Occurs when neutron φ -level drops below stable FHM alignment.
- Represents φ -resonant transition from neutral to charged configuration.
- [Insert visual diagram here]

6.7 Neutron in Nucleon Structures

- Neutron determines spacing between protons.
- Prevents excessive torsional strain in φ -low shells.
- Enables coherent proton clustering in heavy nuclei.
- [Insert visual diagram here]

6.8 Neutron Collapse / Inversion (ϕ^9 Mode)

- Neutron φ^9 mode corresponds to scalar-field transport.
- Matches electron/proton φ^9 symmetry.
- Defines upper limit for neutron stability under extreme strain.
- [Insert visual diagram here]